

1 We claim:

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3 1. A computer management system comprising:

4 a workstation including at least one of the group

5 consisting of a keyboard, a video monitor, a

6 cursor control device, an audio device, and an

7 auxiliary peripheral device.

8 a plurality of computers;

9 a switching system with circuitry for transmitting

10 keyboard, cursor control device, audio, and

11 auxiliary peripheral device signals from said

12 workstation to one of said remote computers, said

13 switching system further comprising circuitry for

14 transmitting keyboard, video, cursor control

15 device, and auxiliary peripheral device signals

16 from said one of said remote computers to said

17 workstation;

18 at least one eight conductor cable for coupling at

19 least one of said computer interface and said

20 user interface to said management unit;

21 wherein said user interface receives at least one of

22 user keyboard signals, user mouse signals, and

23 user audio signals from said user keyboard, said

1           user mouse, and said user audio device,  
2           respectively; and  
3       wherein said user interface transmits said user  
4           keyboard signals, said user mouse signals, and  
5           said user audio signals via said eight conductor  
6           cable to said computer via said management unit.  
7

8   2.   A computer management system according to Claim 1,  
9       wherein said computer interface is further coupled to at  
10      least one computer audio device.  
11

12   3.   A computer management system according to Claim 2,  
13       wherein said computer interface receives computer  
14           keyboard signals from said computer, computer  
15           mouse signals from said computer, computer video  
16           signals from said computer, and computer audio  
17           signals from at least one of said computer and  
18           said computer audio devices; and  
19       wherein said computer interface transmits said  
20           computer keyboard signals, said computer video  
21           signals, said computer mouse signals, and said  
22           computer audio signals via said eight conductor  
23           cable to said user interface via said management  
24           unit.

1

2 4. A computer management system according to Claim 1,  
3 wherein said eight conductor cable comprises at least one  
4 Registered Jack 45 ("RJ-45") connector.

5

6 5. A computer management system according to Claim 3,  
7 wherein said eight conductor cable comprises a first,  
8 second, and third twisted pair of wires that transmit red,  
9 green, and blue components of said computer video signals,  
10 respectively, and further comprises a fourth twisted pair  
11 of wire that transmits at least one of said computer  
12 keyboard signals, said computer mouse signals, and said  
13 computer audio signals.

14

15 6. A computer management system according to Claim 5,  
16 wherein a computer horizontal synchronization signal is  
17 encoded onto one of said green component, said red  
18 component, and said blue component of said computer video  
19 signals.

20

21 7. A computer management system according to Claim 5,  
22 wherein a computer vertical synchronization signal is  
23 encoded onto one of said green component, said red

1 component, and said blue component of said computer video  
2 signals.

3

4 8. A computer management system according to Claim 2,  
5 wherein at least one of said user audio device and said  
6 computer audio device are selected from the group  
7 consisting of a microphone, an analog playback device, a  
8 digital playback device, a cassette player, a compact disc  
9 player, a Digital VideoDisc player, a television, a  
10 computer, a telephone, a cellular telephone, a projector, a  
11 camera, and a personal digital assistant.

12

13 9. A computer management system according to Claim 2,  
14 wherein said computer audio device is at least one of an  
15 audio in port of said computer and an audio out port of  
16 said computer.

17

18 10. A computer management system according to Claim 2,  
19 wherein at least one of said user audio device and said  
20 computer audio device are selected from the group  
21 consisting of a speaker, an audio headset, a projector, an  
22 analog audio recording device, a digital audio recording  
23 device, a second computer, a cassette recorder, a Compact  
24 Disc writer, a Digital VideoDisc writer, a television, a

1 camera, a telephone, a cellular telephone, and a personal  
2 digital assistant.

3

4 11. A computer management system according to Claim 1,  
5 further comprising:

6 an audio cable for coupling said user audio device to  
7 said user interface and for coupling said  
8 computer audio device to said computer interface.

9

10 12. A computer management system according to Claim 11,  
11 wherein said audio cable bidirectionally transmits audio  
12 signals.

13

14 13. A computer management system according to Claim 2,  
15 further comprising:

16 an audio cable for coupling said computer interface to  
17 at least one of an audio in port of said  
18 computer, an audio out port of said computer, and  
19 said computer audio device,

20 wherein said audio cable bidirectionally transmits  
21 audio signals.

22

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24

1 14. A computer management system according to Claim 12,  
2  
3 wherein said computer interface cable comprises at  
4 least one of a first connector for coupling said  
5 computer interface cable to said computer  
6 interface, a second connector for coupling said  
7 computer interface cable to a keyboard port of  
8 said computer, a third connector for coupling  
9 said computer interface cable to a video port of  
10 said computer, a fourth connector for coupling  
11 said computer interface cable to a mouse port of  
12 said computer, a fifth connector and a sixth  
13 connector for coupling said computer interface  
14 cable to a first and a second of said computer  
15 audio devices, and a seventh and an eighth  
16 connector for coupling said computer interface  
17 cable to an audio in port of said computer and an  
18 audio out port of said computer;  
19 wherein said first computer audio device comprises an  
20 audio input device; and  
21 wherein said second computer audio device comprises an  
22 audio output device.

23

24

1 15. A computer management system according to Claim 14,  
2 wherein said computer interface cable transmits  
3 at least one of said user keyboard signals, said user  
4 mouse signals, and said user audio signals from  
5 said computer interface to at least one of said  
6 computer and said computer audio devices; and  
7 wherein said computer interface cable transmits at  
8 least one of said computer keyboard signals, said  
9 computer video signals, said computer mouse  
10 signals, and said computer audio signals to said  
11 computer interface from at least one of said  
12 computer and said computer audio devices.

13

14 16. A computer management system comprising:  
15 at least one computer;  
16 at least one computer interface coupled to said  
17 computer via a computer interface cable;  
18 at least one management unit coupled to said  
19 computer interface; and  
20 at least one user interface coupled to said  
21 management unit and coupled to at least one  
22 of a user keyboard, a user video monitor, a  
23 user mouse, a user audio device, and a user  
24 auxiliary peripheral device;

1        wherein said user interface receives at least one of  
2            user keyboard signals, user mouse signals, user  
3            audio signals, and user auxiliary peripheral  
4            device signals; and  
5        wherein said user interface transmits said user  
6            keyboard signals, said user mouse signals, and  
7            said user auxiliary peripheral device signals to  
8            said computer via said management unit.

9

10    17. A computer management system according to Claim 16,  
11    wherein said computer interface is further coupled to at  
12    least one of a computer audio device and a computer  
13    auxiliary peripheral device.

14

15    18. A computer management system according to Claim 17,  
16    wherein said computer interface receives computer  
17            keyboard signals from said computer, computer  
18            mouse signals from said computer, computer video  
19            signals from said computer, computer audio  
20            signals from at least one of said computer and  
21            said computer audio devices, and computer  
22            auxiliary device signals from said computer  
23            auxiliary peripheral device; and

1        wherein said computer interface transmits said  
2                computer keyboard signals, said computer video  
3                signals, said computer mouse signals, said  
4                computer audio signals, and said computer  
5                auxiliary peripheral signals to said user  
6                interface via said management unit.

7  
8    19.   A computer management system according to Claim 16,  
9    wherein said user interface transmits said user keyboard  
10   signals, said user mouse signals, said user audio signals,  
11   and said user audio peripheral device signals to said  
12   computer via said management unit.

13  
14   20.   A computer management system according to Claim 18,  
15   further including:  
16        at least one eight conductor cable for coupling at  
17                least one of said computer interface and said  
18                user interface to said management unit.

19  
20   21.   A computer management system according to Claim 20,  
21   wherein said eight conductor cable comprises at least one  
22   Registered Jack 45 ("RJ-45") connector.

23

1 22. A computer management system according to Claim 20,  
2 wherein said eight conductor cable comprises a first,  
3 second, and third twisted pair of wires that transmit red,  
4 green, and blue components of said computer video signals,  
5 respectively, and further comprises a fourth twisted pair  
6 of wire that transmits at least one of said computer  
7 keyboard signals, said computer video signals, said  
8 computer mouse signals, said computer audio signals, and  
9 said computer auxiliary peripheral device signals.

10

11 23. A computer management system according to Claim 22,  
12 wherein a computer horizontal synchronization signal is  
13 encoded onto one of said green component, said red  
14 component, and said blue component of said computer video  
15 signals.

16

17 24. A computer management system according to Claim 22,  
18 wherein a computer vertical synchronization signal is  
19 encoded onto one of said green component, said red  
20 component, and said blue component of said computer video  
21 signals.

22

23 25. A computer management system according to Claim 17,  
24 further comprising:

1

2       at least one of a user auxiliary peripheral module and

3             a computer auxiliary peripheral module;

4       wherein said user auxiliary peripheral module couples

5             said user auxiliary peripheral device to said

6             user interface; and

7       wherein said computer auxiliary peripheral module

8             couples said computer auxiliary peripheral device

9             to said computer interface.

10

11   26.   A computer management system according to Claim 25,

12       wherein said user auxiliary peripheral module and said

13       computer auxiliary peripheral module are coupled to said

14       user interface and said computer interface, respectively,

15       via a forty pin ribbon cable.

16

17   27.   A computer management system according to Claim 17,

18       wherein at least one of said user auxiliary peripheral

19       device and said computer auxiliary peripheral device are

20       selected from the group consisting of a serial port device,

21       a Universal Serial Bus device, a Recommended Standard 232

22       device, a PS/19 device, a parallel device, a firewire

23       device, a Registered Jack 28 device, a Registered Jack 21

24       device, a Registered Jack 45 device, a Registered Jack 48

1 device, a British Naval Connector device, a Centronics  
2 device, an Advanced Technology device, a Super-Video  
3 device, a Digital Video Interface device, an Integrated  
4 Development Environment device, a Fiber Distributed Data  
5 Interface device, a switch closure device, or a Small  
6 Computer System Interface device.

7

8 28. A computer management system according to Claim 17,  
9 wherein at least one of said user auxiliary peripheral  
10 device and said computer auxiliary peripheral device are  
11 selected from the group consisting of a keyboard, a mouse,  
12 an optical mouse, a trackball, a Universal Serial Bus  
13 keyboard adapter, a Universal Serial Bus mouse adapter a  
14 second computer, a port expander, a Bluetooth device, a  
15 cellular telephone, a web camera, a floppy disk drive, a  
16 hard disk drive, a Universal Serial Bus Flash Drive, a  
17 digital media reader, a digital media writer, a microphone,  
18 a speaker, a subwoofer, a scanner, a copier, a printer, a  
19 projector, a television, an analog monitor, a digital  
20 monitor, a video capture device, a modem, a hub, a router,  
21 a switch, a cable modem, a Digital Subscriber Line modem, a  
22 wireless network hub, a wireless network router, a wireless  
23 access point, a print server, a wireless print server, an  
24 Ethernet adapter, an analog audio playback device, an

1 analog audio recording device, a digital audio playback  
2 device, a digital audio recording device, a tape drive, a  
3 storage backup device, a joystick, a game pad, a power  
4 supply, an uninterruptible power supply, a Universal Serial  
5 Bus hub, a Compact Disc Read Only Memory device, a Compact  
6 Disc write device, a Compact Disc re-write device, an audio  
7 device, a Digital VideoDisc Random Access Memory device, a  
8 camera, a cassette recorder, a headset, a camcorder, a  
9 fingerprint reader, a retina scanner, a biometric  
10 authentication device, and a personal digital assistant.

11

12 29. A computer management system according to Claim 17,  
13 wherein at least one of said user audio device and said  
14 computer audio device is a microphone, an analog playback  
15 device, a digital playback device, a cassette player, a  
16 compact disc player, a Digital VideoDisc player, a  
17 television, a computer, a telephone, a cellular telephone,  
18 a projector, a camera, and a personal digital assistant.

19

20 30. A computer management system according to Claim 17,  
21 wherein said computer audio device is at least one of an  
22 audio in port of said computer and an audio out port of  
23 said computer.

1 31. A computer management system according to Claim 17,  
2 wherein at least one of said user audio device and said  
3 computer audio device is a speaker, an audio headset, a  
4 projector, an analog audio recording device, a digital  
5 audio recording device, a second computer, a cassette  
6 recorder, a Compact Disc writer, a Digital VideoDisc  
7 writer, a television, a camera, a telephone, a cellular  
8 telephone, and a personal digital assistant.

9  
10 32. A computer management system according to Claim 16,  
11 further comprising:  
12 at least one audio cable;  
13 wherein said audio cable couples at least one of said  
14 user audio device to said user interface and said  
15 computer audio device to said computer interface.

16  
17 33. A computer management system according to Claim 32,  
18 wherein said audio cable bidirectionally transmits audio  
19 signals.

20  
21 34. A computer management system according to Claim 17,  
22 further comprising:  
23 an audio cable for coupling said computer interface to  
24 at least one of an audio in port of said

1 computer, an audio out port of said computer, and  
2 at least one of said computer audio devices;  
3 wherein said audio cable bidirectionally transmits  
4 audio signals.

5  
6 35. A computer management system according to Claim 25,  
7 wherein said computer interface cable comprises at  
8 least one of a first connector for coupling said  
9 computer interface cable to said computer  
10 interface, a second connector for coupling said  
11 computer interface cable to a keyboard port of  
12 said computer, a third connector for coupling  
13 said computer interface cable to a video port of  
14 said computer, a fourth connector for coupling  
15 said computer interface cable to a mouse port of  
16 said computer, a fifth connector and a sixth  
17 connector for coupling said computer interface  
18 cable to a first and a second of said computer  
19 audio devices, a seventh and an eighth connector  
20 for coupling said computer interface cable to an  
21 audio in port of said computer and an audio out  
22 port of said computer, and a ninth connector for  
23 coupling said computer interface cable to at

1           least one of said auxiliary peripheral device and  
2           said auxiliary peripheral device module;  
3       wherein said first computer audio device comprises an  
4           audio input device; and  
5       wherein said second computer audio device comprises an  
6           audio output device.

7  
8   36.   A computer management system according to Claim 35,  
9       wherein said computer interface cable transmits at  
10           least one of said user keyboard signals, said  
11           user mouse signals, said user audio signals, and  
12           said user auxiliary peripheral device signals  
13           from said computer interface to at least one of  
14           said computer and said computer audio devices;  
15           and  
16       wherein said computer interface cable transmits at  
17           least one of said computer keyboard signals, said  
18           computer video signals, said computer mouse  
19           signals, said computer audio signals, and said  
20           computer auxiliary peripheral device signals to  
21           said computer interface from at least one of said  
22           computer and said computer audio devices.

23  
24

1 37. A method of transmitting signals via a computer  
2 management system comprising the steps of:  
3 receiving keyboard signals, video signals, mouse  
4 signals, and audio signals at a transmission  
5 node;  
6 forming a data packet comprising said keyboard  
7 signals, said mouse signals, and said audio  
8 signals;  
9 encoding a vertical synchronization signal onto one of  
10 a red, blue, and green component of said video  
11 signals;  
12 encoding a horizontal synchronization signal onto one  
13 of said red component, said blue component, and  
14 said green component of said video signals;  
15 transmitting said data packet to a receiving node via  
16 a first pair of wires in an eight conductor  
17 cable;  
18 transmitting said red component of said video signals  
19 to said receiving node via a second pair of wires  
20 in said eight conductor cable;  
21 transmitting said blue component of said video signal  
22 to said receiving node via a fourth pair of wires  
23 in said eight conductor cable; and

1       transmitting said green component of said video signal  
2               to said receiving node via a third pair of wires  
3               in said eight conductor cable.

4

5   38. A method according to Claim 37, further comprising the  
6   steps of:

7       converting said data packet to a differential signal;  
8       converting said red component of said video signals to  
9               a differential signal;  
10      converting said green component of said video signals  
11             to a differential signal; and  
12      converting said blue component of said video signals  
13             to a differential signal.

14

15   39. A method according to Claim 37, wherein said data  
16   packet comprises a first section for representing a length  
17   of said data packet, a second section for representing said  
18   audio signals, and a third section for representing said  
19   keyboard signals and said mouse signals.

20

21   40. A method according to Claim 37, wherein said audio  
22   device is selected from the group consisting of a  
23   microphone, an analog playback device, a digital playback  
24   device, a cassette player, a compact disc player, a Digital

1 VideoDisc player, a television, a computer, a telephone, a  
2 cellular telephone, a projector, a camera, and a personal  
3 digital assistant.

4

5 41. A method according to Claim 37, wherein said audio  
6 device is at least one of an audio in port of said computer  
7 and an audio out port of said computer.

8

9 42. A method according to Claim 37, wherein said audio  
10 device is selected from the group consisting of a speaker,  
11 an audio headset, a projector, an analog audio recording  
12 device, a digital audio recording device, a second  
13 computer, a cassette recorder, a Compact Disc writer, a  
14 Digital VideoDisc writer, a television, a camera, a  
15 telephone, a cellular telephone, and a personal digital  
16 assistant.

17

18 43. A method of transmitting signals via a computer  
19 management system comprising the steps of:

20 receiving keyboard signals, video signals, mouse  
21 signals, and auxiliary peripheral device signals  
22 at a transmission node;  
23 forming a data packet comprising said keyboard

1           signals, said mouse signals, and said auxiliary  
2           peripheral signals;  
3       encoding a vertical synchronization signal onto one of  
4           a red, blue, and green component of said video  
5           signals;  
6       encoding a horizontal synchronization signal onto one  
7           of said red component, said blue component, and  
8           said green component of said video signals;  
9       transmitting said data packet to a receiving node via  
10           a first pair of wires in an eight conductor  
11           cable;  
12       transmitting said red component of said video signals  
13           to said receiving node via a second pair of wires  
14           in said eight conductor cable;  
15       transmitting said blue component of said video signal  
16           to said receiving node via a fourth pair of wires  
17           in said eight conductor cable; and  
18       transmitting said green component of said video signal  
19           to said receiving node via a third pair of wires  
20           in said eight conductor cable.

21

22   44.   A method according to Claim 43, further comprising  
23   the steps of:

24

1        converting said data packet to a differential signal;  
2        converting said red component of said video signals to  
3            a differential signal;  
4        converting said green component of said video signals  
5            to a differential signal; and  
6        converting said blue component of said video signals  
7            to a differential signal.

8

9    45. A method according to Claim 44, wherein said data  
10 packet comprises a first section for representing a length  
11 of said data packet, a second section for representing said  
12 auxiliary peripheral device signals, and a third section  
13 for representing said keyboard signals and said mouse  
14 signals.

15

16 46. A method according to Claim 43, wherein said auxiliary  
17 peripheral device is selected from the group consisting of  
18 a serial port device, a Universal Serial Bus device, a  
19 Recommended Standard 232 device, a PS/19 device, a parallel  
20 device, a firewire device, a Registered Jack 28 device, a  
21 Registered Jack 21 device, a Registered Jack 45 device, a  
22 Registered Jack 48 device, a British Naval Connector  
23 device, a Centronics device, an Advanced Technology device,  
24 a Super-Video device, a Digital Video Interface device, an

1 Integrated Development Environment device, a Fiber  
2 Distributed Data Interface device, a switch closure device,  
3 or a Small Computer System Interface device.

4

5 47. A method according to Claim 43, wherein said auxiliary  
6 peripheral device is selected from the group consisting of  
7 a keyboard, a mouse, an optical mouse, a trackball, a  
8 Universal Serial Bus keyboard adapter, a Universal Serial  
9 Bus mouse adapter a second computer, a port expander, a  
10 Bluetooth device, a cellular telephone, a web camera, a  
11 floppy disk drive, a hard disk drive, a Universal Serial  
12 Bus Flash Drive, a digital media reader, a digital media  
13 writer, a microphone, a speaker, a subwoofer, a scanner, a  
14 copier, a printer, a projector, a television, an analog  
15 monitor, a digital monitor, a video capture device, a  
16 modem, a hub, a router, a switch, a cable modem, a Digital  
17 Subscriber Line modem, a wireless network hub, a wireless  
18 network router, a wireless access point, a print server, a  
19 wireless print server, an Ethernet adapter, an analog audio  
20 playback device, an analog audio recording device, a  
21 digital audio playback device, a digital audio recording  
22 device, a tape drive, a storage backup device, a joystick,  
23 a game pad, a power supply, an uninterruptible power  
24 supply, a Universal Serial Bus hub, a Compact Disc Read

1 Only Memory device, a Compact Disc write device, a Compact  
2 Disc re-write device, an audio device, a Digital VideoDisc  
3 Random Access Memory device, a camera, a cassette recorder,  
4 a headset, a camcorder, a fingerprint reader, a retina  
5 scanner, a biometric authentication device, and a personal  
6 digital assistant.